GOVT. DIGVIJAY AUTONOMOUS P.G. COLLEGE RAJNANDGAON (C.G.)
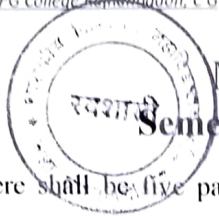
SCHEME OF EXAMINATION & SYLLABUS

Of

M.Sc. (MATHEMATICS)

UNDER
FACULTY OF SCIENCE
Session 2021-22

(Approved by Board of Studies)
Effective from July 2021

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DEPARTMENT OF MATHEMATICS

M.SC. MATHEMATICS
Semester System, 2021-22 Onwards

There shall be five papers (Theory/Practical) in M.Sc. Mathematics Course (Third & Fourth semester) Mathematics in each Semester. All are compulsory. Each paper Will have 100 (80 Theory+20 Internal Assessment) Marks. Overall marks in Theory and Practical in each semester will be 500. The course content of each paper has been divided into four units. However, there will be internal choice in each Unit.

First Semester

Course	Subject	Theory	Int.Ass.	Max Marks
Paper-I	Advanced Abstract Algebra (I)	80	20	100
Paper-II	Real Analysis (I)	80	20	100
Paper-III	Topology (I)	80	20	100
Paper-IV	Complex Analysis (I)	80	20	100
Paper-V	Advanced Discrete Mathematics (I)	80	20	100

Second Semester

Course	Subject	Theory	IntAss.	Max Marks
Paper-I	Advanced Abstract Algebra (II)	80	20	100
Paper-II	Real Analysis (II)	80	20	100
Paper-III	General and Algebraic Topology (II)	80	20	100
Paper-IV	Complex Analysis (II)	80	20	100
Paper-V	Advanced Discrete Mathematics (II)	80	20	100
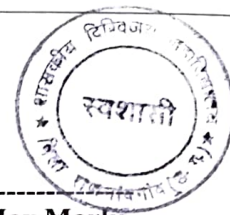
Third Semester

Course	Subject	Theory	Practical	Int,.Ass.	Max Marks
Paper I	Integration Theory and Functional Analysis (I)	80	-	20	100
Paper-II	Partial Differential Equations	80	-	20	100
Paper-III	Programming in C (ANSI features) Theory and Practical (I)	50	30	20	100
Paper-IV	Operations Research (I)	80	-	20	100
Paper-V	Optional -1				
	Fuzzy Sets and Its Applications (I)	80	-	20	100
	Optional -2				
	Fundamental of Computer Science				
	Theory & Practical	50	30	20	100
	(Object oriented programming and Data structure)				

Fourth Semester

Course	Subject	Theory	Practical	Int. Ass.	Max Marks
Paper-I	Functional Analysis (II)	80	-	20	100
Paper-II	Mechanics	80	-	20	100
Paper-III	Programming in C (ANSI features) Theory and Practical (II)	50	30	20	100
Paper-IV	Operations Research (II)	80	-	20	100
Paper-V	Optional -1				
	Fuzzy Sets and Its Applications (II)	80	-	20	100
	Optional -2				
	Operating System data base				
	Management System				
	Theory & Practical	50	30	20	100

M.Sc. Mathematics (Third Semester) 2020-21

PAPER-V (Optional-1) *PMTCT-305*

FUZZY SETS AND ITS APPLICATIONS (I)

Max Marks. 80

Unit-I Fuzzy Sets, basic definitions, alpha-level sets, convex fuzzy sets, Basic operations On fuzzy sets, Cartesian product, Algebraic products, bounded sum and difference, t-norms and t-conorms.

Unit-II Extension Principle- the Zadeh's extension principle, Image and inverse image of fuzzy sets,Fuzzy numbers. Elements of fuzzy arithmetic

Unit-III Fuzzy relations and fuzzy graphs- Fuzzy relations on fuzzy sets, composition Of fuzzy relations, min-max composition and its properties, fuzzy equivalence relations, fuzzy compatibility relations, fuzzy relation equations, fuzzy graphs, similarity relation

Unit IV Possibility Theory, Fuzzy measure, evidence theory necessity measure, possibility measure, possibility distribution, possibility theory and fuzzy sets, Possibility theory versus probability theory

Internal Assessment: 20

References

H.J.Zmmemann. Fuzzy Set theory and its Applications. Allied Publishers Ltd. New Delhi 1991.

G.J. Klir and B.Yuan, Fuzzy Sets and Fuzzy logic. Prentice-Hall of India,New Delhi.1995

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M.Sc. Mathematics (Third Semester) 2020-21

PAPER-V (Optional-2) *PMTET-306*

FUNDAMENTALS OF COMPUTER SCIENCE
THEORY AND PRACTICAL
(OBJECT ORIENTED PROGRAMMING AND DATA STRUCTURE)

Max. Marks. 100 (Theory-50 +Practical-30+Internal -20)

Unit-I   Object Oriented Programming-Classes and Scope, nested classes, pointer class members; Class initialization, assignment and destruction.

Unit-II Overloaded functions and operators; Templates including class templates; class inheritance and virtual functions.

Unit-III Data Structures-Analysis of algorithms, q, W, 0, o, w notations; Sequential and linked representations, Lists, Stacks, and queues;

Unit-IV Trees: Binary tree- search tree implementation, B-tree (concept only); Sorting: Insertion sort, shell sort, quick-sort, heap sort and their analysis;Hashing-open and closed.

Books Recommended:

1. S. B. Lipman, J. Lajoi: C++ Primer, Addison Wesley.
2. B. Stroustrup; The C++ Programming Language, Addison Wesley.
3. C. J. Date : Introduction to Database Systems, Addison Wesley.
4. C. Ritehie: Operating Systems-Incorporating UNIX and Windows, BPB Publications.
5. M. A. Weiss, Data Structures and Algorithm Analysis in C++, Addison Wesley

Practical Examination Scheme
Max. Marks – 30 Time Duration – 3 Hrs.
Practical (two) 20 Marks (10 marks each)
Viva 05 Marks
Sessional 05 Marks

M.Sc. Mathematics (Fourth Semester) 2020-21
PAPER-V (Optional-1)
FUZZY SETS AND ITS APPLICATIONS (II)

PMTCT — 405

Max Marks. 80

Unit-I Fuzzy Logic-An overview of classical logic, Multivalued logics, Fuzzy propositions. Fuzzy quantifiers. Linguistic variables and hedges. Inference from conditional fuzzy propositions, the compositional rule of inference

Unit-II Approximate Reasoning-An overview of Fuzzy expert system. Fuzzy implications and their selection. Multiconditional approximate reasoning. The role of fuzzy relation equation

Unit-III An introduction to Fuzzy Control-Fuzzy controllers. Fuzzy rule base. Fuzzy inference engine. Fuzzification.Defuzzification and the various defuzzitication methods (the centre of area, the centre of maxima, and the mean of maxima methods)

Unit IV Decision Making in Fuzzy Environment-Individual decision making. Multiperson decision making. Multicriteria decision making. Multistage decision making. Fuzzy ranking methods. Fuzzy linear programming

Internal Assessment: 20

References

1. H.J. Zmmemann, Fuzzy set theory and its Applications, Allied Publishers Ltd. New Delhi, 1991.

2. G.J. Klir and B. Yuan- Fuzzy sets and fuzzy logic, Prentice-Hall ol India, New Delhi, 1995.

PMTET-406

M.Sc. Mathematics (Fourth Semester) 2020-21
PAPER-V (Optional-2)
OPERATING SYSTEM AND DATABASE MANAGEMENT SYSTEM
THEORY AND PRACTICAL

Max. Marks. 100 (Theory-50 +Practical-30+Internal -20)

Unit-I Database Systems-Role of database systems, database system architecture and data modelling

Unit-II **Introduction** to relational algebra and relational calculus

Unit-III Introduction to SQL. Basic features including views; Integrity constraints, Database design-normalization up to BCNF.

Unit-IV Operating Systems- Overview of operating system, user interface, processor management, memory management. I/O management, concurrency and Security, network and distributed systems

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1. S. B. Lipman, J. Lajoi. C++ Primer, Addison Wesley.
2. B. Stroustrup, The C++ Programming Language, Addison Wesley.
3. C. J. Date. Introduction to Database Systems, Addison Wesley
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